Forest Health Protection

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Special Project Report

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To: District Ranger, American River Ranger District, Tahoe National Forest

Subject: Star Fire – Survivability of Fire-Injured Trees (NE-SPR-05-02)

Thank you for allowing Forest Health Protection (FHP) to implement and continue monitoring fire-injured trees in the 2001 Star Fire. We greatly appreciated the cooperation of District personnel in setting up the study. Our current District contact for the project is Karen Jones. Enclosed please find a copy of the original study plan, a map of tree locations and a summary of data collected from 2002 to 2004.

As part of this project, 288 trees are being monitored through 2006 or longer if funds are available. Individual study trees have a numbered metal tag at the base that corresponds with an orange painted number at breast height. Trees also have two bands of orange paint around their circumference (please note that some of the orange paint may have faded to white). Please continue to notify us if there is a need to remove study trees that have died. Verification of full crown fade and the tree number are required prior to tree removal.

Data for all FHP fire-injured tree survivability studies are currently being analyzed. A presentation at the National Silvicultural Workshop (June 2005, Lake Tahoe) is planned followed by a publication in the conference proceedings. Please contact us if you have any questions or concerns.

/s/ Danny Cluck

Danny Cluck
Entomologist

/s/ Sheri Smith

Sheri Smith
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Summary of data for the 2001 Star Fire

Table 1. Total number of trees and mortality by year.

Species	# of trees evaluated in 2002 (all live)	2002 Mortality	2003 Mortality	2004 Mortality	Total Mortality
White fir	191	2	90	55	147
Sugar pine	74	2	50	16	68
TOTAL	**265**	**4**	**140**	**71**	**215**

Table 2. Number of trees and % survival by percent remaining live crown.

Live Crown (%)	# of white fir	% survival	# of sugar pine	% survival
0<10	26	8%	1	0%
10<20	52	4%	9	0%
20<30	44	18%	18	0%
30<40	34	44%	17	12%
40<50	17	47%	11	0%
50+	18	44%	18	33%

Table 3. Number of trees and % survival by cambium scorch rating.

Cambium Scorch Rating	# of white fir	% survival	# of sugar pine	% survival
0	26	46%	3	0%
1	38	37%	7	29%
2	53	17%	13	23%
3	43	16%	18	6%
4	30	3%	33	6%

- Rating of 0-4 is based on a cambium sample taken in each of four equally spaced directions near ground level. A rating of 0 is equal to no fire damage for any sample and 4 is dead cambium at each sample location.

Table 4. Number of trees and % survival by diameter breast height.

DBH (inches)	# of white fir	% survival	# of sugar pine	% survival
20-30	142	25%	40	13%
30+	47	17%	34	9%

ADMINISTRATIVE STUDY

SURVIVABILITY OF FIRE INJURED TREES
STAR FIRE
FORESTHILL RANGER DISTRICT, TAHOE NATIONAL FOREST

Monitoring Plan

Objective: To evaluate, document and monitor the survivability of trees that sustained fire injuries.

Time frame: The study will be implemented during the summer of 2002 and will continue for a minimum of four years or longer as necessary and appropriate.

Procedure: At least 30 trees in each of several diameter classes and species types will be included in the monitoring. Trees will be selected either by plot design or on an individual tree basis.

All signs and symptoms of insects and diseases and other tree conditions will be documented.

The selected trees will be marked using yellow paint. The trees were marked with a painted number at approximately breast height and a metal numbered tag located near ground level. The painted numbers were marked on the side facing away from the Divide Road.

The selected trees will be protected for the duration of the study from management activities that could influence the results. Trees that die during the study, may be considered for salvage as part of normal salvage sale procedures if, 1) they have been photographed and otherwise documented according to the study monitoring requirements, and 2) tree removal will not impact the remaining designated study trees so as to affect their survival and influence the results of this study.

Initially each tree will be photographed to document the condition of the tree. Additional photos will be taken as necessary to show the fire-related injuries (ie. crown dieback, cambium damage, etc.). Subsequent photographs will be taken as necessary to document further changes in tree condition (e.g. when/if tree condition changes and/or attacks by insects become apparent).

The following data will be taken for each tree.

a) Species
b) DBH
c) Tree height

d) % live crown remaining (estimated from pre-fire crown)
f) any insect or pathogen activity
g) cambium injury (determined by four samples taken in the cardinal directions with a gas powered drill, samples take near ground level, recorded as scorched or healthy cambium)

The following data will be taken for the general area where the trees are located.

a) site index
b) slope
c) aspect
d) pre-fire basal area/acre

A stem map and or GPS will be used to depict tree locations.

Monitoring: The criteria for monitoring tree condition is as follows:

1. Tree condition
    a) live
    b) dead
    c) crown fade
    d) branch dieback
    f) other

2. Cause of condition
    a) directly related to fire
    b) subsequent insect attack
    c) other

3. Frequency of monitoring
    a) Initial (set up and photographs) summer 2002
    b) Annually or more often as needed

Data Steward: FHP will initiate data management and be responsible for data collection. District personnel will be involved as much they desire to be. District personnel are encouraged to become involved.

Reports: FHP will write monitoring reports as needed to document changes in tree condition. Reports will be distributed as appropriate.

Location: Star Fire, American River Ranger District, Tahoe National Forest